IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

McKinley et al.
Application No.: 10/053,488

Art Unit: 2624
Conf. No.: 3362

Filed: November 2, 2001

For: PARALLEL PROCESSING OF DIGITAL WATERMARKING OPERATIONS

VIA ELECTRONIC FILING

Examiner: W. Chen

Date: July 14, 2009

REPLY BRIEF

This Reply Brief is in response to the Examiner's Answer dated May 20, 2009. Please charge any fee required to deposit account 50-1071.

The following section replies to the Examiner's response to Applicants' argument starting at the bottom of page 19 of the Examiner's Answer. To keep the remarks as brief as possible, the following focuses on addressing issues raised in the Examiner's Answer. The omission of arguments made previously does not mean that the arguments are withdrawn.

Claims 4, 18-19 and 23-24, 26-28 are not anticipated by Vynne

Claim 4

Vynne clearly does not divide frames into blocks based on the analysis of the media signal to identify parts of the media signal having characteristics that are more likely to carry a readable watermark signal. As such, the Examiner's Answer is now alleging that Vynne teaches a further subdividing of these blocks into "residual image data" and motion vectors, and then further alleges that the residual image data and motion vectors are computed based on an analysis to identify parts of a media signal that are more likely to carry a readable watermark signal. This is clearly not the teaching of Vynne. Instead, as noted by Vynne at col. 14, lines 43-53, the residual image data and motion vectors are common outputs of any block-based compression video scheme (col. 43, lines 43-49), and that is why Vynne's embedding method relies on standard motion estimation used in such schemes to compute this data. The motion estimation method used to compute residual image data and motion vectors is a standard aspect of the block based compression scheme and is not an analysis of the media signal to identify parts of the media signal that are more likely to carry a readable watermark signal.

While the Examiner now contends that Vynne's residual image data and motion vectors correspond to the segments of the media signal recited in claim 4, the rest of the Examiner's arguments for claim 4 rely on the interpretation that Vynne's blocks correspond to the claimed segments, as opposed to the residual image data and motion vector of a particular block. This further demonstrates that Vynne does not disclose the claimed subdividing and that the Examiner's application of Vynne's teaching to other elements of claim 4 is inconsistent with the interpretation applied to the recited act of subdividing the media signal into segments.

The rest of Applicants arguments for claim 4 remain valid and need not be repeated again here.

Claim 18

The Examiner's citations refer to Vynne's method of selecting blocks for "coding," as corresponding to the claim recitation that "the media signal is segmented based on probability of watermark detection." Vynne's criteria for block selection used in embedding operations is intended to select blocks with motion vectors that can be changed such that the change is invisible. See col. 17, lines 42-44. In short, Vynne's criteria is designed to make the embedded information invisible, and Vynne provides no teaching or suggestion that this criteria relates to probability of watermark detection. Moreover, claim 18 recites: "prioritized for parallel watermark decoding operations based on probability of watermark detection." Vynne's selection of blocks clearly does not prioritize the media signal for parallel watermark decoding operations based on probability of detection.

Claim 23

The Examiner contends that Vynne's thresholds used in block selection criteria correspond to the following elements of the claimed perceptual mask of claim 23: 1. A perceptual mask that is dependent on and automatically computed from the content of the media signal; 2. Is re-used to apply different watermarks to copies; 3. the perceptual mask specifies areas of the media signal and 4. The perceptual mask is used to control embedding of watermark in the areas.

As noted in the brief, Vynne's thresholds are not dependent on and automatically computed from the content of the media signal. Vynne provides no teaching that the threshold is computed from the content of the media signal. The Examiner confuses the issue by suggesting that some aspects of the tuning of the thresholds is performed on-line, and thus, involves a computer. Clearly, the fine tuning involves a computer because it is an interactive process in which a user selects a threshold that gives a visually acceptable result, but the computer does not compute the threshold from the content of the media signal.

While Vynne's thresholds are used over and over once they are "tuned," there is no disclosure of applying different watermarks to copies as claimed.

The thresholds in Vynne are used to select blocks for which the motion vector is changed, but they do not specify areas of the media signal. However, even assuming that the thresholds specify areas as an indirect result of making a block selection as the Examiner contends, they do not then also control embedding of the watermark in the areas. Vynne's embedding operates by changing the motion vector of a selected block. The threshold in Vynne does not control this embedding within a block because it has no effect on how the motion vector is changed. The threshold is merely used to select the block. Vynne's block selection cannot both read on the claimed perceptual mask specifying areas of the media signal, on the one hand, and also, "used to control embedding **in** the area" on the other hand because once the threshold is used to select a block, it is not used to control embedding in the block.

Claims 4, 18-19 and 23-24, 26-28 are not obvious in view of Vynne

On pages 27-28 of the Answer, the Examiner has made an issue of Applicants' attempt to simplify the arguments in the brief by addressing both the anticipation rejections and obviousness rejections based on Vynne in one argument section. Ultimately, in response to a notice of non-compliance, Applicants were forced to separate the arguments into separate sections, even though both anticipation and obviousness were addressed fully in one section. The Examiner questions how one set of arguments could counter both anticipation and obviousness rejections. The answer is simple. The Examiner relied on Vynne for both grounds, and Applicants showed how Vynne did not anticipate nor render obvious these claims by identifying claim elements that Vynne failed to disclose (no anticipation) and failed to teach or suggest (no obviousness).

The Examiner's reference to an alternative argument about claim 4 on page 27-28 of the Answer does not change the result that Vynne does not render claims 4, 18-19 and 23-24, 26-28 obvious. This argument appears to be only in reference to claim 4, for which Applicants pointed out that Vynne does not distribute the prioritized segments among parallel processors (namely, since the claim states: "distributing the prioritized segments to parallel processors," the act of "distributing" comes after the segments are prioritized because, otherwise, there would be no "prioritized segments" to distribute). In particular, the Examiner notes that Vynne mentions the possibility of using predefined variables (such as the number of processors available _NPES and

the current processor number _MYPE) to make execution different on different processors see col. 26, lines 42-52, and synchronizing and exchanging data between processing elements. See Vynne at col. 26, lines 50-55 and line 65. From the first teaching, the Examiner concludes that "one program can direct each PE to perform different execution." From the second teaching, the Examiner concludes that one processor element can read the result from another processor element and continue processing. From this, the Examiner concludes that it is obvious that segments could be prioritized and re-distributed to other processor elements as needed. First, the Examiner's conclusions are directly contradictory to Vynne's clear teaching that "Only one program exists, which is executed on all processors at the same time" col. 26, lines 42-44, and the variables relating to the number of processor elements (_NPES) and the current processor (_MYPE) clearly do not alter this clear teaching in a meaningful way relative to the claims. Second, the Examiner makes an overbroad assertion that is equivalent to the conclusion that all means to distribute blocks for watermarking amount to an obvious design choice. The fact that Vynne can use a different number of processors just means that the number or processor elements are scalable to the size of the computing task. It says nothing about the claim term at issue regarding prioritizing media signal segments and then distributing those prioritized segments to parallel processors. Based on Vynne's teachings, one of skill in the art would simply vary the number of processor elements with the variable _NPES while executing the same program on each element. Vynne does not suggest any optimizations on the processing task prior to distributing blocks among processors.

Clam 2 is not obvious in view of Vynne

Claim 2

In the Answer, the Examiner contends that "Applicants do not challenge the above conclusion" that claim 2 is obvious in view of Vynne. This is incorrect. The Brief clearly states why Vynne does not suggest all of the claim elements, and, even further, notes that Vynne teaches away from the claimed method as follows: "Vynne teaches away from claim 2 because it teaches distributing all blocks of an image to processors and then selecting "suitable" blocks for modification of the motion vectors after all of the blocks have been distributed. This is a

different and inefficient approach because it requires that resources be consumed to distribute all of the blocks, including blocks that are later deemed to be unsuitable for further processing."

Even assuming that Vynne's mention of synchronization is relevant to the claim, Vynne's general reference to synchronization provides no suggestion of the claimed approach that would overcome Vynne's clear teaching to the contrary (namely, to distribute all blocks to the processor elements, and then let each processor select blocks independently).

Claim 2 is patentable over Vynne and Hawkins

In the Answer, the Examiner contends that the Applicants did not present persuasive arguments why Vynne and Hawkins cannot be combined. This is incorrect because Applicants showed that, even if combined, Vynee and Hawkins did not teach all of the elements of claim 2. Moreover, the Final Rejection (see pages 18-19 of the Final Rejection) did not provide any reason why Vynne and Hawkins would be combined by one of ordinary skill in the art, so the Office provided no reason for the Applicants to refute.

In the Answer, the Examiner offers new reasons for the combination that are based on a faulty premise that Applicants already showed was not correct, namely that "Hawkins teaches segmenting a general media object for parallel watermarking operations." Applicants brief explained that this is not correct. The Examiner contends that one of skill in the art would treat insertion of a watermark signal in a one of the selected blocks in Vynne as a job in Hawkins. This improper hindsight reconstruction because, as noted, Vynne teaches to the contrary, namely, distributing all blocks among processors prior to identifying for which blocks the motion vectors will be modified. It is unlikely that one of skill in the art would treat the insertion of a watermark in one block of Vynne as a task in Hawkins because that task is simply modifying a single motion vector (each block has one motion vector in Vynne), and that simple task is not worth the extra cost and overhead of parallel processing. Moreover, as noted, Hawkins is completely silent with respect to subdividing a content signal into parts and processing those parts as separate tasks on parallel processors. Therefore, it is highly unlikely that based on these teachings of Vynne and Hawkins, one of skill in the art would use Hawkin's job processing to schedule the task of modifying a single motion vector per block in Vynne on parallel processors.

Claim 34 is patentable over the combination of Shinoda and Vynne

The Examiner's Answer responds to Applicants arguments concerning claim 34 by alleging that they amount to only a general allegation. Applicants carefully reviewed Shinoda and the Examiner's citations to it and pointed out the specific shortcomings of the reference in the Brief. In response, the Examiner contends that he "recited several portions of Shinoda for teaching embedding multiple documents." Shinoda only discusses handling requests to mark one image at a time. The Examiner appears to suggest that if Shinoda's system received multiple requests, it would result in embedding multiple images by handling those requests one at a time. However, claim 34 recites elements such as an embedder control file that includes elements for a batch form of processing of a list of media signal files. To repeat the succinct argument in the Brief, rather than making a general allegation, Applicants have specifically shown that the cited references do not teach elements of claim 34 relating to batch processing, such as "the requests including a list of media signal files and information to be linked with the media signal files," and "a batch registration extractor for reading the registration database and creating an embedder control file, including identifiers, a corresponding list of media signal files, and embedding instructions for controlling embedding of the identifiers in the media signal files" [emphasis on elements dealing with batch embedding on a list of media signal files added].

For the foregoing reasons, and those detailed in the Brief, the appealed rejections must be reversed.

Respectfully submitted,

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